



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P O Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

909 7590 07/09/2009

PILLSBURY WINTHROP SHAW PITTMAN, LLP  
P.O. BOX 10500  
MCLEAN, VA 22102

EXAMINER

SWEARINGEN, JEFFREY R

ART UNIT

PAPER NUMBER

2445

DATE MAILED: 07/09/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/578,156	05/23/2000	Lundy Lewis	019287-0317293	4279

TITLE OF INVENTION: METHOD AND APPARATUS FOR EVENT CORRELATION IN SERVICE LEVEL MANAGEMENT (SLM)

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	10/09/2009

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

**PART B - FEE(S) TRANSMITTAL**

Complete and send this form, together with applicable fee(s), to: **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax** (571) 273-2885

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

909 7590 07/09/2009

PILLSBURY WINTHROP SHAW PITTMAN, LLP  
P.O. BOX 10500  
MCLEAN, VA 22102

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or by facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/578,156	05/23/2000	Lundy Lewis	019287-0317293	4279

TITLE OF INVENTION: METHOD AND APPARATUS FOR EVENT CORRELATION IN SERVICE LEVEL MANAGEMENT (SLM)

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	10/09/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
SWEARINGEN, JEFFREY R	2445	709-223000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

"Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys

or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

## 3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent):  Individual  Corporation or other private group entity  Government

## 4a. The following fee(s) are submitted:

Issue Fee  
 Publication Fee (No small entity discount permitted)  
 Advance Order - # of Copies \_\_\_\_\_

## 4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

A check is enclosed.  
 Payment by credit card. Form PTO-2038 is attached.  
 The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

## 5. Change in Entity Status (from status indicated above)

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments or the amount of time you require to complete this form or other suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P O Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/578,156	05/23/2000	Lundy Lewis	019287-0317293	4279
909	7590	07/09/2009	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP				SWEARINGEN, JEFFREY R
P.O. BOX 10500		ART UNIT		PAPER NUMBER
MCLEAN, VA 22102		2445		DATE MAILED: 07/09/2009

## Determination of Patent Term Extension under 35 U.S.C. 154 (b)

(application filed after June 7, 1995 but prior to May 29, 2000)

The Patent Term Extension is 0 day(s). Any patent to issue from the above-identified application will include an indication of the 0 day extension on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Extension is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/578,156	LEWIS, LUNDY	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jeffrey R. Swearingen	2445	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTO-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

- This communication is responsive to RCE of 4/24/09.
- The allowed claim(s) is/are 1-6,9-13,15-18,20,21 and 23-28.

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)  All    b)  Some\*    c)  None    of the:

- Certified copies of the priority documents have been received.
- Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

- A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
- CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
- DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- Notice of References Cited (PTO-892)
- Notice of Draftsperson's Patent Drawing Review (PTO-948)
- Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
- Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
- Notice of Informal Patent Application
- Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
- Examiner's Amendment/Comment
- Examiner's Statement of Reasons for Allowance
- Other \_\_\_\_\_.

A/IVEK SRIVASTAVA/  
Supervisory Patent Examiner, Art Unit 2445

#### **DETAILED ACTION**

##### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 4/24/09 has been entered.

##### ***Terminal Disclaimer***

2. The terminal disclaimer filed on 4/24/09 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of the full statutory term of prior patent No. 6,430,712 has been reviewed and is accepted. The terminal disclaimer has been recorded.

#### **EXAMINER'S AMENDMENT**

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jafar Ali on 7/2/2009.

The application has been amended as follows:

1. (Currently Amended) A computer-implemented system for providing service level management comprising:

a network having a plurality of network hardware components that support a service provided over the network, wherein performance of the service depends upon performances of the plurality of network hardware components that support the service, and wherein the service has a state that represents the performance of the service;

a plurality of monitoring agents configured to monitor respective individual domains of the network that include respective subsets of the plurality of network hardware components that support the service, wherein the plurality of monitoring agents include:

a first monitoring agent configured to monitor one or more component parameters for a first subset of the plurality of network hardware components in a first domain of the network, detect one or more intra-domain events in the first domain as a function of the component parameters monitored in the first domain, and generate one or more intra-domain alarms in the first domain as a function of the intra-domain events detected in the first domain; and

a second monitoring agent configured to monitor one or more component parameters for a second subset of the plurality of network hardware components in a second domain of the network, detect one or more intra-domain events in the second domain as a function of the component parameters monitored in the second domain,

and generate one or more intra-domain alarms in the second domain as a function of the intra-domain events detected in the second domain; and

an alarm correlation agent configured to:

correlate the intra-domain alarms generated in the first domain and the second domain to generate one or more inter-domain alarms across the first domain and the second domain;

map the inter-domain alarms generated across the first domain and the second domain to a service parameter that represents a current state of the service, wherein the current state of the service is undesirable when the service parameter has a value that does not meet or exceed a service level identified in a service level agreement; and

issue one or more instructions to autonomously establish a desirable state of the service in response to the current state of the service being undesirable, wherein the desirable state of the service is established when the instructions cause the value of the service parameter to meet or exceed the service level identified in the service level agreement.

4. (Currently Amended) The system of claim 3, wherein the reasoning agents comprise:

at least one rule-based reasoning agent having a working memory that includes a plurality of facts relating to the service, a rule base that represents knowledge relating to additional facts to infer and actions to take based on the facts in the working memory, and an inference engine configured to make one or more inferences based on the facts in the working memory and the knowledge represented in the rule base;

at least one model-based reasoning agent having a plurality of models that represent the plurality of network hardware components that support the service and a correlation architecture that provides collaboration among the plurality of models;

at least one state-transition graph based reasoning agent having fuzzy logic that defines grades of membership for a plurality of states, wherein the grades of membership quantify transitions among the plurality of states;

at least one code book based reasoning agent; and

at least one case-based reasoning agent having a case library that includes a plurality of cases representing episodes of problem solving, a plurality of relevance rules for identifying one or more of the cases in the case library that are relevant to a current problem relating to the service, and parameterized adaption logic that adapts solutions variables associated with the identified cases for the current problem relating to the service.

6. (Currently Amended) A computer-implemented system for providing service level management comprising:

a network having a plurality of network hardware components that support a service provided over the network, wherein performance of the service depends upon performances of the plurality of network hardware components that support the service, and wherein the service has a state that represents the performance of the service;

a first monitoring agent configured to:

monitor one or more component parameters for a first subset of the plurality of network hardware components in a first domain of the network;

detect one or more intra-domain events in the first domain as a function of the component parameters monitored in the first domain; and

generate one or more intra-domain alarms in the first domain as a function of the intra-domain events detected in the first domain;

a second monitoring agent configured to:

monitor one or more component parameters for a second subset of the plurality of network hardware components in a second domain of the network;

detect one or more intra-domain events in the second domain as a function of the component parameters monitored in the second domain; and

generate one or more intra-domain alarms in the second domain as a function of the intra-domain events detected in the second domain;

an alarm bucket configured to receive the intra-domain alarms generated in the first domain and the second domain from the first monitoring agent and the second monitoring agent; and

an alarm correlation agent configured to:

correlate the ~~the~~-intra-domain alarms in the alarm bucket to generate one or more inter-domain alarms across the first domain and the second domain;

map the inter-domain alarms generated across the first domain and the second domain to a service parameter that represents a current state of the service, wherein the current state of the service is undesirable when the service parameter has a value that does not meet or exceed a service level identified in a service level agreement; and

issue one or more instructions to autonomously establish a desirable state of the service in response to the current state of the service being undesirable, wherein the desirable state of the service is established when the instructions cause the value of the service parameter to meet or exceed the service level identified in the service level agreement.

10. (Currently Amended) The system of claim 6, wherein the first monitoring agent and the second monitoring agent comprise reasoning agents that provide reactive or reflexive behavior designed for short-term problem solving relating to the service, and wherein the alarm correlation agent comprises a reasoning agent that provides deliberative behavior designed for long-term problem solving relating to the service, wherein the reasoning agents comprise:

at least one rule-based reasoning agent having a working memory that includes a plurality of facts relating to the service, a rule base that represents knowledge relating to additional facts to infer and actions to take based on the facts in the working memory, and an inference engine configured to make one or more inferences based on the facts in the working memory and the knowledge represented in the rule base;

at least one model-based reasoning agent having a plurality of models that represent the plurality of network hardware components that support the service and a correlation architecture that provides collaboration among the plurality of models;

at least one state-transition graph based reasoning agent having fuzzy logic that defines grades of membership for a plurality of states, wherein the grades of membership quantify transitions among the plurality of states;

at least one code book based reasoning agent; and

at least one case-based reasoning agent having a case library that includes a plurality of cases representing episodes of problem solving, a plurality of relevance rules for identifying one or more of the cases in the case library that are relevant to a current problem relating to the service, and parameterized adaption logic that adapts solutions

variables associated with the identified cases for the current problem relating to the service.

11. (Currently Amended) A computer-implemented system for providing service level management comprising:

a network having a plurality of network hardware components that support a service provided over the network, wherein performance of the service depends upon performances of the plurality of network hardware components that support the service, and wherein the service has a state that represents the performance of the service;

a plurality of monitoring agents, wherein each of the plurality of monitoring agents are configured to:

monitor one or more component parameters for a subset of the plurality of network hardware components in a respective domain of a plurality of domains of the network;

detect one or more intra-domain events in the respective domain as a function of the component parameters monitored in the respective domain; and

generate one or more intra-domain alarms in the respective domain as a function of the intra-domain events detected in the respective domain; and

an alarm correlation agent, wherein the alarm correlation agent is configured to:

correlate the intra-domain alarms generated in the respective domains by the plurality of monitoring agents to generate one or more inter-domain alarms across the plurality of domains of the network;

map the inter-domain alarms generated across the plurality of domains of the network to a service parameter that represents a current state of the service, wherein

the current state of the service is undesirable when the service parameter has a value that does not meet or exceed a service level identified in a service level agreement; and issue one or more instructions to autonomously establish a desirable state of the service in response to the current state of the service being undesirable, wherein the desirable state of the service is established when the instructions cause the value of the service parameter to meet or exceed the service level identified in the service level agreement.

12. (Currently Amended) The system of claim 11, wherein the alarm correlation agent comprises a reasoning agent that provides deliberative behavior designed for long-term problem solving relating to the service, wherein the reasoning agent comprises:

at least one rule-based reasoning agent having a working memory that includes a plurality of facts relating to the service, a rule base that represents knowledge relating to additional facts to infer and actions to take based on the facts in the working memory, and an inference engine configured to make one or more inferences based on the facts in the working memory and the knowledge represented in the rule base;

at least one model-based reasoning agent having a plurality of models that represent the plurality of network hardware components that support the service and a correlation architecture that provides collaboration among the plurality of models;

at least one state-transition graph based reasoning agent having fuzzy logic that defines grades of membership for a plurality of states, wherein the grades of membership quantify transitions among the plurality of states;

at least one code book based reasoning agent; and

at least one case-based reasoning agent having a case library that includes a plurality of cases representing episodes of problem solving, a plurality of relevance rules for identifying one or more of the cases in the case library that are relevant to a current problem relating to the service, and parameterized adaption logic that adapts solutions variables associated with the identified cases for the current problem relating to the service.

21. (Currently Amended) A computer hardware device readable medium having computer executable instructions recorded thereon, wherein the computer executable instructions are operable to direct a computer hardware device to perform a method for providing service level management, the method comprising:

providing a service over a network having a plurality of network components that support the service, wherein performance of the service depends upon performances of the plurality of network components that support the service, and wherein the service has a state that represents the performance of the service;

monitoring one or more component parameters for the plurality of network components that support the service using a plurality of monitoring agents, wherein each of the plurality of monitoring agents are configured to monitor a subset of the plurality of network components in a respective domain of a plurality of domains of the network;

detecting one or more intra-domain events in each of the respective domains as a function of the component parameters monitored by the plurality of monitoring agents in the respective domains;

generating one or more intra-domain alarms in each of the respective domains as a function of the intra-domain events detected in the respective domains;

correlating the intra-domain alarms generated in the respective domains using an alarm correlation agent, wherein the alarm correlation agent is configured to correlate the intra-domain alarms to generate one or more inter-domain alarms across the plurality of domains of the network;

mapping the inter-domain alarms generated across the plurality of domains of the network to a service parameter that represents a current state of the service, wherein the current state of the service is undesirable when the service parameter has a value that does not meet or exceed a service level identified in a service level agreement; and

issuing one or more instructions to autonomously establish a desirable state of the service in response to the current state of the service being undesirable, wherein the desirable state of the service is established when the instructions cause the value of the service parameter to meet or exceed the service level identified in the service level agreement.

23. (Currently Amended) A computer-implemented system for providing service level management comprising:

a network having a plurality of network hardware components that support a service provided over the network, wherein performance of the service depends upon performances of the plurality of network hardware components that support the service, and wherein the service has a state that represents the performance of the service;

a plurality of monitoring agents configured to monitor respective individual domains of the network that include respective subsets of the plurality of network hardware components that support the service, wherein the plurality of monitoring agents is configured to detect one or more intra-domain events in the respective domain as a function of the component parameters monitored in the respective domain and generate one or more intra-domain alarms in the respective domain as a function of the intra-domain events detected in the respective domain, wherein each of the plurality of monitoring agents include:

an alarm correlation agent configured to correlate the intra-domain alarms generated in the respective domain in addition to one or more intra-domain alarms generated in the other individual domains by the other monitoring agents to generate one or more inter-domain alarms across the individual domains of the network, map the inter-domain alarms generated across the individual domains and to a service parameter that represents a current state of the service, wherein the current state of the service is undesirable when the service parameter has a value that does not meet or exceed a service level identified in a service level agreement; and

a control agent configured to control the component parameters for the subset of the plurality of network hardware components in the respective monitored domain and issue one or more instructions for one or more of the controlled component parameters to autonomously establish a desirable state of the service in response to the current state of the service being undesirable, wherein the desirable state of the service is established when the instructions cause the value of the service parameter to meet or exceed the service level identified in the service level agreement.

25. (Currently Amended) The system of claim 23, wherein the plurality of monitoring agents comprise reasoning agents that provide reactive or reflexive behavior designed for short-term problem solving relating to the service, and wherein the alarm correlation agent within each of the plurality of monitoring agents comprises a reasoning agent that provides deliberative behavior designed for long-term problem solving relating to the services, and wherein the reasoning agents comprise:

at least one rule-based reasoning agent having a working memory that includes a plurality of facts relating to the service, a rule base that represents knowledge relating to additional facts to infer and actions to take based on the facts in the working memory, and an inference engine configured to make one or more inferences based on the facts in the working memory and the knowledge represented in the rule base;

at least one model-based reasoning agent having a plurality of models that represent the plurality of network hardware components that support the service and a correlation architecture that provides collaboration among the plurality of models;

at least one state-transition graph based reasoning agent having fuzzy logic that defines grades of membership for a plurality of states, wherein the grades of membership quantify transitions among the plurality of states;

at least one code book based reasoning agent; and

at least one case-based reasoning agent having a case library that includes a plurality of cases representing episodes of problem solving, a plurality of relevance rules for identifying one or more of the cases in the case library that are relevant to a current problem relating to the service, and parameterized adaption logic that adapts solutions

variables associated with the identified cases for the current problem relating to the service.

26. (Currently Amended) A computer hardware device readable medium having computer executable instructions recorded thereon, wherein the computer executable instructions are operable to direct a computer hardware device to perform a method for providing service level management, the method comprising:

providing a service over a network having a plurality of network components that support the service, wherein performance of the service depends upon performances of the plurality of network components that support the service, and wherein the service has a state that represents the performance of the service;

monitoring one of a plurality of domains of the network using the agent operating on the computer, wherein the monitored domain includes a subset of the plurality of network components that support the service;

detecting one or more intra-domain events in the monitored domain as a function of the component parameters monitored in the domain;

generating one or more intra-domain alarms in the monitored domain as a function of the intra-domain events detected in the monitored domain;

correlating the intra-domain alarms generated in the monitored domain, the intra-domain events detected across the plurality of domains, and the intra-domain alarms generated across the plurality of domains to generate one or more inter-domain alarms across the plurality of domains of the network;

mapping the inter-domain alarms generated across the plurality of domains of the network to a service parameter that represents a current state of the service, wherein

the current state of the service is undesirable when the service parameter has a value that does not meet or exceed a service level identified in a service level agreement; and issuing one or more instructions to autonomously establish a desirable state of the service in response to the current state of the service being undesirable, wherein the desirable state of the service is established when the instructions cause the value of the service parameter to meet or exceed the service level identified in the service level agreement.

4. The following is an examiner's statement of reasons for allowance: The prior art fails to teach or suggest a system where monitoring agents monitor individual domains, detect intra-domain events, generate intra-domain alarms, correlate the intra-domain alarms into an inter-domain alarm, and use the inter-domain alarm to issue instructions to establish a desired state of the service when the current state of the service is undesirable and does not meet a service level agreement.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Drawings***

5. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the drawings are hand lettered and are difficult to read in places due to the submitted screen shots (see Figures 19, 20, 35 and 36 for non-limiting examples of drawings which are illegible). Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. Swearingen whose telephone number is (571)272-3921. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on 571-272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeffrey R. Swearingen  
Examiner  
Art Unit 2445

/J. R. S./  
Examiner, Art Unit 2445

/VIVEK SRIVASTAVA/

Supervisory Patent Examiner, Art Unit 2445